

REMARKS

Claims 1-52 are pending in the application. No new matter has been added. Reconsideration of the claims is respectfully requested in view of the amendments and the arguments provided below.

Information Disclosure Statements

Five information disclosure statements have been submitted in this case:

1. June 17, 2002 – 30 references
2. August 26, 2002 – 10 references
3. April 4, 2003 – 1 reference
4. August 7, 2003 – 1 reference
5. February 4, 2004 – 3 references

The Examiner has acknowledged only IDS's nos. 2 and 4 by returning initialed copies of the related Forms 1449. In the Amendment submitted on December 11, 2003, the Examiner was requested to acknowledge IDS's 1 and 3 (June 17, 2002 and April 4, 2003) by forwarding initialed copies of Forms 1449 to Applicants' representative. The requested initialed copies have not yet been received.

A fifth IDS was submitted in this case on February 4, following the submission of the Amendment of December 11, 2003 (a courtesy copy of the Feb, 4, 2004 IDS, without references, accompanies this Response). There was no initialed copy of the 1449 Form from the February 4, 2004 IDS mailed with the present Office Action. Furthermore, the present Office Action did not even acknowledge Applicants' prior request for initialed Forms 1449.

Once again, Applicants respectfully request that the Examiner return initialed copies of Forms 1449 from IDSs 1, 3, and 5.

Double-Patenting Rejections

Claims 1, 22, 26, 43 and 50 are rejected under the judicially created doctrine of obviousness-type double-patenting as being unpatentable over claims 1, 26 and 34 of co-pending U.S. Application Serial No. 10/014,278 (the '278 application). Furthermore, claims 1, 22, 26, 43 and 50 are rejected under the judicially created doctrine of obviousness-type double-patenting as being unpatentable over claims 1, 19, 20 and 29 of co-pending U.S. Application Serial No.

10/015,151 (the '151 application). Applicants respectfully disagree with the statement in the Office Action that the claims of the present case are not patentably distinct over the cited claims of the '278 and '151 applications. Applicants contend that the claims of the present application are patentable over the cited claims of the '278 and '151 applications.

Applicants note that, since the double patenting rejections are based only on pending applications, and not on an issued patent, the double patenting rejections can only be provisional MPEP § 804, for example Chart I-B and subsections I.B and I.C. Accordingly, since the double patenting rejections are provisional, these rejections need not be addressed until one of the applications issues as a patent.

Rejections under 35 U.S.C. § 102

Claims 1-4, 8, 16 and 26-50 are rejected under 35 U.S.C. § 102(e) as being anticipated by Kanehira et al. (U.S. Patent No. 5,202,878) (Kanehira). It is stated that Kanehira discloses a laser system comprising a laser (11) producing a beam of output light, a detector unit (43) and a fringe producing optical element (42,5) disposed in the beam of output light to direct a first portion of the beam of output light to the detector unit (43) as a second light beam, an interference pattern being produced in the second light beam by the fringe-producing optical element.

This characterization of Kanehira is incorrect. In fact, Kanehira teaches (col. 5, lines 5-21, col. 5, line 49- col. 6, line 8) that the laser diode (11) emits a light beam that is collimated in the collimating lens (2) (col. 5, lines 5-8). The collimated beam is transmitted through a polarizing beamsplitter (5) and a quarter-wave retardation plate (6), and is focused by an objective lens (7) to the recording medium (8) (col. 5, lines 12-15). The light diffracted by the recording medium is reflected back through the quarter-wave retardation plate (6) and into the polarizing beamsplitter (5) (col. 5, lines 52-57). Due to the double-pass through the quarter-wave plate (6), the polarization of the light is now at 90° to what it was when the light was transmitted through the polarizing beamsplitter (5) (col. 5, lines 54 – 61). As a result, the light is reflected by the polarizing beamsplitter (5) to the linear detector (43) (col. 5, lines 61-63). A beamsplitter (42) splits off a fraction of the light to a tracking servo-detector (9) which is used to control the position of the objective lens (7) (col. 5, line 63 – col. 6, line 2).

Independent Claim 1

Independent claim 1 is directed to a laser system that comprises a laser capable of producing a beam of output light and a detector unit. A fringe-producing optical element is disposed in the beam of output light to direct a first portion of the beam of output light to the detector unit as a second light beam. An interference fringe pattern is produced in the second light beam by the fringe-producing optical element. A second portion of the output light beam, different from the first portion, propagates from the fringe-producing optical element. A control unit is coupled to receive detector information from the detector unit. The control unit is coupled to the laser to control the wavelength of the beam of output light in response to the information received from the detector unit.

To anticipate a claim, the reference must teach every element of the claim. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Therefore, all claim elements, and their limitations, must be found in the prior art reference to maintain a rejection based on 35 U.S.C. §102. Applicants respectfully submit that Kanehira does not teach every element of the rejected claims, and therefore fails to anticipate the claims.

The fringe-producing element is disposed in the output beam produced by the laser. The fringe-producing element splits the output beam into first and second portions. The fringe-producing element also causes an interference fringe pattern in the first portion.

Kanehira fails to teach a fringe-producing element that splits the output beam into first and second portions. Although it is stated in the Office Action that elements (5) and (43) constitute fringe-producing elements, this is wrong. Element (5) is a polarizing beamsplitter. Element (43) is a beamsplitter. Kanehira does not teach that these elements produce interference fringes.

It is stated, however, at col. 6, lines 5-8, that "the signal detecting linear sensor 43 detects the optical interference pattern of the reflected diffraction beam..." (emphasis added). Thus, there is an interference pattern detected by the linear detector (43). This interference pattern is not created by the polarizing beamsplitter (5) or the beamsplitter (43), but arises due to the diffraction of the light at the recording medium (8) ("diffraction beam reflected by the track of the

recording medium 8 is caused”, col. 5, lines 53-54). Thus, Kanehira fails to teach a fringe-producing element that produces first and second beam portions.

Kanehira also fails to teach a control unit that controls the wavelength of the beam of output light in response to the information received from the detector unit. It is stated in the Office Action that “it is inherent a control unit coupled to receive detector (43) information from the detector unit (43) and coupled to the laser (11) to control the wavelength of the beam of output light in response to the information received from the detector unit (43) because Kanehira disclose for stable recording on column 2, line 9, therefore the laser has been controlled [sic].” Applicants respectfully disagree that Kanehira teaches that the control unit controls the wavelength of the laser.

Kanehira’s disclosure is related to apparatus used for optical recording, for example on CD-ROMs. In the Background section, col. 1, lines 59-66, Kanehira states that “the method of recording a set of information at a certain area as a patten is used by the simple systems which carry out neither tracking nor focusing, but the recording density achieved with the method is low”. Kanehira subsequently addresses the problem of tracking and focusing the laser that records information so that the recording density is high: “the object of the present invention is therefore to provide an optical recording and reproducing method and apparatus for the same, capable of stably recording multi-value information on a recording medium by a more compact and simpler means and reproducing the multi-value information from the recording medium by detecting any change in the optical interference pattern in the track width and length directions of the recording medium” (col. 2, lines 7-14). It is also stated (col. 5, line 66 – col. 6, line 2) that “the focus tracking servo-detector 9 detects any change in the light quantity of the reflected diffraction beam to control the position of the objective (7) so as to enable optimum beam spots to be focused on the track of the recording medium.” Thus, one of the ways in which the tracking of the light spot is controlled is to control the position of the objective lens (7).

Nowhere does Kanehira teach that the control unit controls the wavelength of the laser diode, based on the interference fringe introduced by the fringe-producing element. Instead, Kanehira discusses controlling the laser to effect high recording density, i.e. better tracking of the position of the laser light spot.

Thus, Kanehira fails to teach at least the fringe-producing element and the control unit of the present invention, and so Kanehira fails to teach all the elements of claim 1, and claim 1 is not anticipated by Kanehira.

Independent Claim 26

The invention of method claim 26 is directed to a method of stabilizing an operating frequency of an output light beam produced by a laser. The method comprises splitting a first portion from the output light beam as a second light beam using a fringe-producing optical element. The fringe-producing optical element causes an interference fringe pattern in the second light beam. A second portion of the output light beam, different from the first portion, propagates from the fringe-producing optical element. Portions of the interference fringe pattern are detected using a detector unit. Detector signals are produced in response to the detected portions of the interference fringe pattern. A frequency control signal is generated in response to the detector signals, and the laser is tuned in response to the frequency control signal so that the operating frequency of the output light beam is substantially at a desired value.

Kanehira fails to teach all the elements of claim 26. In particular, Kanehira fails to teach causing an interference pattern in the second light beam using a fringe-producing element that splits the light beam into two separate beams. Instead, Kanehira teaches producing a diffraction pattern by reflecting light off a recording medium, the diffracted light producing an interference pattern. The recording medium does not split the beam up into two parts, however. Kanehira also teaches the use of a polarizing beamsplitter and a beamsplitter. Kanehira does not teach that the beamsplitters create interference fringes. Instead, Kanehira teaches that the interference fringes arise due to the diffraction of the light beam at the recording medium.

In addition, Kanehira fails to teach tuning a laser in response to a frequency control signal generated in response to the interference fringes. Instead, Kanehira teaches controlling a laser spot for writing to a recording medium.

Accordingly, claim 26 is not anticipated by Kanehira.

Regarding claims 26 and 43, it is stated in the Office Action that the methods of stabilizing an operating frequency of an output light beam are considered as product by process steps. Applicants respectfully assert that it is wrong to characterize claims 26-49 as product by

process claims. Claims 26-49 are method claims, and have nothing to do with product-by-process.

Independent claim 43

The invention of independent claim 43 is directed to a method of stabilizing an operating frequency of an output light beam produced by a laser. The method comprises splitting a first portion from the output light beam as a second light beam using a fringe-producing optical element, the fringe-producing optical element causing an interference fringe pattern in the second light beam, a remainder of the output light beam after splitting the first portion being a second portion of the output light beam. The operating frequency of the output light beam is stabilized using the interference fringe pattern.

Kanehira fails to teach all the elements of claim 43. In particular, Kanehira fails to teach splitting a first portion of light from a light beam using a fringe-producing element. Kanehira's optical recording medium diffracts the light to cause an interference pattern, but does not split light. The interference pattern is used to control the position of the focused light spot on the recording medium. Kanehira does not teach that the beamsplitters (5) and (42) create an interference pattern.

In addition, Kanehira fails to teach stabilizing the output frequency of a laser. Kanehira teaches controlling a laser for optical recording, but does not teach that the laser frequency is one of the laser parameters that is controlled for optical recording.

Kanehira, therefore, fails to teach all the elements of claim 43 and thus fails to anticipate claim 43.

Independent claim 50

The invention of independent claim 50 is directed to a system for stabilizing an operating frequency of an output light beam produced by a laser. The system comprises a laser capable of producing an output light beam. The system also comprises fringe-forming means for splitting the output light beam into a second light beam and a third light beam and for forming an interference fringe pattern in the second light beam, the third light beam propagating from the fringe-forming means. The system also includes means for stabilizing the operating frequency of the output light beam using the interference fringe pattern.

Kanehira fails to teach all the elements of independent claim 50. In particular, Kanehira fails to teach fringe-producing means that produces a first beam with an interference fringe pattern and a second beam that propagates from the fringe-producing means. Instead, Kanehira teaches that the interference pattern arises from diffraction by the recording medium. The recording medium does not, however, split the light beam. Also, Kanehira fails to teach stabilizing the frequency of the output light beam. Instead, Kanehira teaches the control of a laser for optical recording, but does not teach that the laser frequency is one of the parameters controlled. Instead, the interference pattern arising from the recording medium is dependent on the position of the focused light beam relative to the optical recording track.

Accordingly, Kanehira fails to teach all the elements of claim 50, and so claim 50 is not anticipated.

Dependent claims 2-4, 8, 16, 27-42 and 44-49

Dependent claims 2-4, 8, 16, 27-42 and 44-49, which are dependent from independent claims 1, 26, and 43, were also rejected under 35 U.S.C. §102 as being anticipated by Kanehira. While Applicants do not acquiesce with the particular rejections to these dependent claims, it is believed that these rejections are moot in view of the remarks made above in connection with independent claims 1, 26 and 43. These dependent claims include all of the limitations of the base claim and any intervening claims, and recite additional features which further distinguish these claims from the cited references. Therefore, dependent claims 2-4, 8, 16, 27-42 and 44-49 are also in condition for allowance.

Regarding claim 4, it is stated in the Office Action that the second light beam includes a first component from a first side (5) of the fringe-producing element and a second component

from a second side (42) of the fringe-producing optical element. Applicants respectfully disagree. These elements are simply beamsplitters, and have their beamsplitting surfaces set at an angle to the incident beam. Splitting the beam in the beamsplitters does not result in the generation of interference fringes.

Rejection under 35 U.S.C. § 103

Dependent claims 5-7, 9-15, 17-25, 51 and 52 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Kanehira in view of Vilhelmsson et al. (U.S. Patent Publication No. 2002/0181519) (Vilhelmsson). Vilhelmsson has been described previously.

Dependent Claims 5-7, 9-15, and 17-21

Vilhelmsson fails to correct the deficiencies of Kanehira discussed above. In particular, Vilhelmsson fails to teach a frequency stabilized laser system in which a fringe-producing element is disposed in the output beam from the laser to produce a second light beam on which is imposed an interference fringe pattern that is used for stabilizing the laser frequency. Instead, Vilhelmsson teaches the use of a beamsplitter to split off a portion of the laser's output beam, and then the creation of an interference fringe pattern from that portion that was split off. Note that Vilhelmsson does not teach that the beamsplitter causes an interference pattern.

Accordingly, dependent claims 5-7, 9-15 and 17-21 are allowable over the proposed combination of Kanehira with Vilhelmsson.

Regarding claims 9-15 and 17, it is stated in the Office Action that it would have been obvious to one of ordinary skill in the art at the time the invention was made to have different kinds of etalon, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. Applicants respectfully disagree with the Examiner. The Examiner has essentially taken Official Notice that the different embodiments of etalon described in claims 9-15 and 17 are well known. Applicants respectfully request that the Examiner provide specific evidence that it was known to use each of the different embodiments of etalon discussed in claims 9-15 and 17 for measuring wavelength of laser light and for applying such a measurement to wavelength stabilization.

Regarding claim 18, neither of the proposed combinations of references teach or suggest using a fringe-producing element to produce first and second portions of the output light beam, where the interference fringe pattern is imposed on the first portion and the second portion is focused into an optical fiber, for example as a useful optical output.

Independent Claim 22

It is stated in the Office Action that Kanehira does not teach an optical communications transmitter unit, a control unit, an optical receiver unit and an optical fiber communication link, but that Vilhelmsson teaches these elements, and that it would have been obvious to one of ordinary skill in the art to modify Kanehira to have the transmitter, control unit, receiver and fiber communications link as taught by Vilhelmsson because those skilled in the art will recognize that such modification and variations can be made without departing from the spirit of the invention.

Applicants respectfully disagree. Three criteria must be met to establish a *prima facie* case of obviousness. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference. Second, there must be a reasonable expectation of success. Finally, the prior art reference, or combination of references, must teach or suggest all the claim limitations. MPEP § 2142. Applicants respectfully traverse the rejection since the prior art fails to disclose all the claim limitations and there would be no motivation to combine the references as proposed by the Examiner.

First, the proposed combinations of references fail to teach or suggest all the elements of the invention of independent claim 22. In particular, none of the references teach or suggest a wavelength stabilizing unit that includes a detector unit and a fringe-producing optical element disposed in the laser output beam, where the fringe-producing element directs a first portion of the laser output beam to the detector unit as a second light beam and causes an interference fringe pattern in the second light beam, and where a second portion of the output light beam propagates from the fringe-producing optical element to be transferred in the optical fiber communications link. Accordingly, the proposed combinations of references fail to teach or suggest all the elements of claim 22.

In addition, the motivation provided in the Office Action for combining the references in the manner suggested is inadequate. The proposed motivation is “because those skilled in the art

will recognize that such modification and variations can be made without departing from the spirit of the invention.” This is not motivation, since it does not provide a reason why one of ordinary skill in the art would want to make the combination. The mere fact that the references can be combined or modified is not sufficient to establish *prima facie* obviousness. MPEP § 2143.01.

Furthermore, Vilhelmsson teaches that a beamsplitter is used to split off a portion of the output beam from the laser, and then that split portion is directed to an etalon, a fringe-producing element. Thus Vilhelmsson teaches that a beamsplitter is not a fringe-producing element. One of ordinary skill would not be motivated, therefore, to add more beamsplitters to Vilhelmsson’s system to produce a fringe-producing element, as is suggested in the Office Action.

Thus, since the proposed combinations of references fail to teach or suggest all the elements of the invention, and since insufficient motivation has been provided to make the combinations as proposed, Applicants respectfully assert that the invention of claim 22 is patentable over the proposed combinations of references.

Dependent Claims 23-25

Dependent claims 22-25 depend from allowable claim 22 and are also, therefore, allowable.

Dependent claims 51 and 52

Dependent claims 51 and 52 depend from allowable claims 26 and 43 respectively and, therefore, are also allowable.

Conclusion

In view of the reasons provided above, it is believed that all pending claims are in condition for allowance. Applicants respectfully request favorable reconsideration and early allowance of all pending claims.

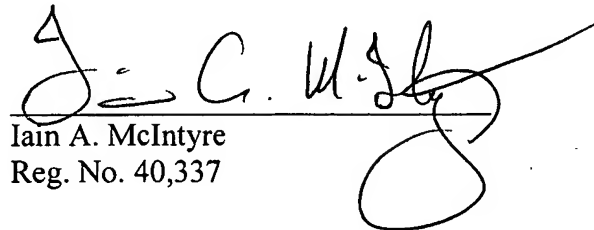
If a telephone conference would be helpful in resolving any issues concerning this communication, please contact Applicants' attorney of record, Iain A. McIntyre at 612-436-9610.

Respectfully submitted,

CCVL P.A.
Customer Number 38846

Date: April 28, 2004

By:


Iain A. McIntyre
Reg. No. 40,337